All Graphs are Not the Same

Strand: Probability and Statistics

Topic: Compare Histograms to stem-and-leaf, line plots and circle graphs

Primary SOL: 7.9 The student, given data in a practical situation, will

               c)   compare histograms with the same data represented in stem-and-leaf plots, line plots, and circle graphs.

Related SOL: 7.9a, 7.9b

Materials

- Graphs (attached)
- Graph paper
- Technology (if available)
- Sticky notes

Vocabulary

circle graph, frequency table, line plot, measures of central tendency, range, stem-and-leaf plot (earlier grades)

comparison, frequency distribution, histogram, inference, prediction (7.9)

Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. Review circle graphs, line plots, and stem-and-leaf plots with students.

2. Given the attached graphs, create small student groups and have each group match the appropriate histogram, circle graph, line plot, and stem-and-leaf plot with each graph that shows the same data. Students should then give each graph an appropriate title and label the graphs as needed.

3. Have student groups do a gallery walk, in which they write comments on a sticky note stating they agree or disagree with the other groups matching and attaching the note to the group's answers.

4. Student groups should correct their matches based on gallery walk feedback and their observations.

5. Given a set of data (whether students collect it or it's given) have student groups create a line plot, stem-and-leaf plot, circle graph, and histogram. Technology can be used to create most items, if needed.

6. Student groups should share their information with the class in order to receive appropriate feedback.

Assessment

- **Questions**
  - How is a histogram different from a line plot? A circle graph? A stem-and-leaf plot?
  - When is it more appropriate to use a histogram? A line plot? A circle graph? A stem-and-leaf plot?

- **Journal/Writing Prompts**
  - If you were given data on the different heights of students in the classroom, which graph would you use and why?
  - Explain what information a histogram can show and what it cannot show.
- **Other**
  - Find a histogram online. Create a similar graph based on the data given.
  - Find a circle graph online. Create a similar graph based on the data given.
  - Find a line plot online. Create a similar graph based on the data given.
  - Find a stem-and-leaf plot online. Create a similar graph based on the data given.
  - Students should make discoveries on the similarities and differences of the different graphs.

Extensions and Connections (for all students)

- In groups of four, use two calendars from *Weather Underground* that show the weather in Blacksburg (or change to a city of your choice) in January and February, and graph the two months using circle graphs, line plots, histograms, and stem-and leaf graphs. Based on your group's graphs, come up with some conclusions.

  [Virginia Tech January 2017 Daily Weather Calendar – Weather Underground](#)

  [Virginia Tech February 2017 Daily Weather Calendar – Weather Underground](#)

 *Note – webpages are best viewed in Google Chrome

Strategies for Differentiation

- Assign students of varying abilities to each group in steps 2–6.
- Ensure each student within the groups has a meaningful role in each activity.
- Provide larger depictions of the attached graphs as needed.

Note: The following pages are intended for classroom use for students as a visual aid to learning.
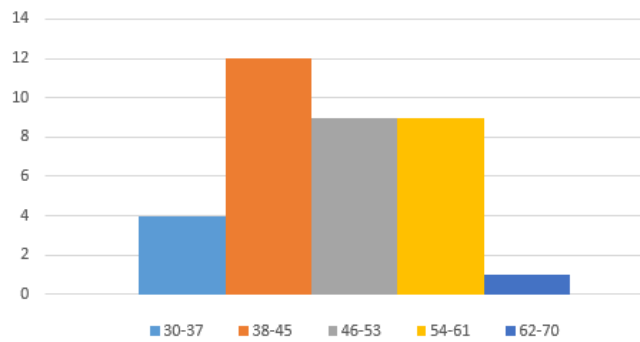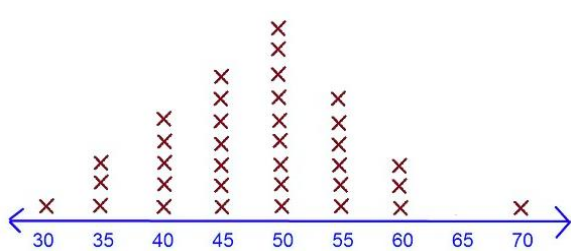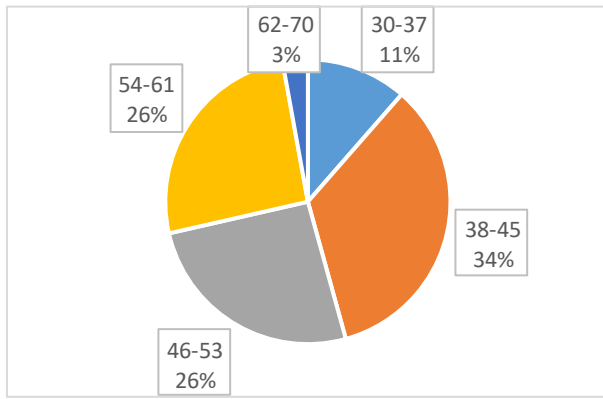
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Graphs
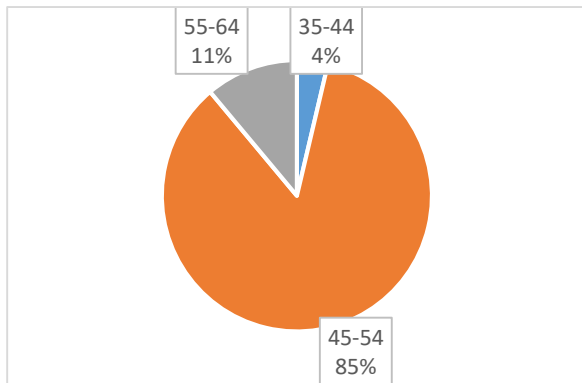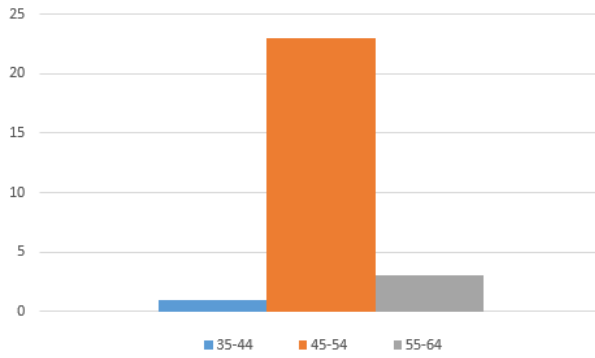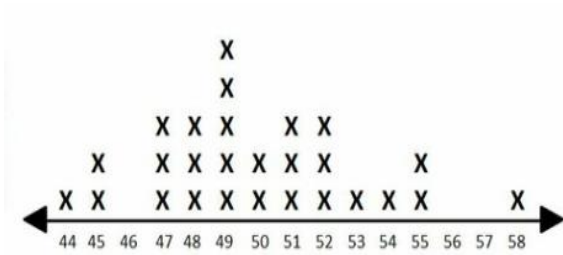
stem	Column 1
4	4 5 5 7 7 7 8 8 8 9 9 9 9 9
5	0 0 1 1 1 2 2 2 3 4 5 5 8

key: 5 | 8 means 58

Graphs
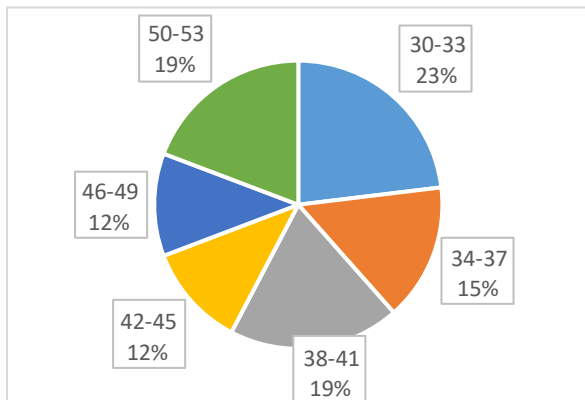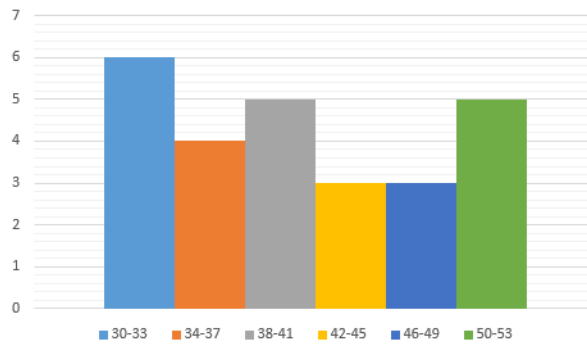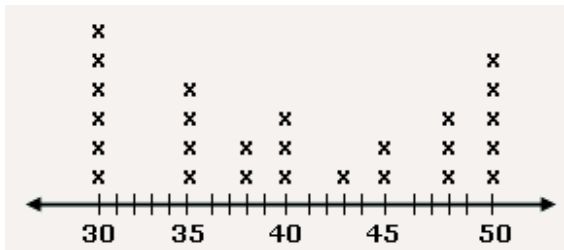
stem	Column 1
3	0 5 5 5
4	0 0 0 0 0 5 5 5 5 5 5 5
5	0 0 0 0 0 0 0 0 0 5 5 5 5 5 5
6	0 0 0
7	0

key: 7 | 0 means 70

stem	Column 1
3	0 0 0 0 0 0 5 5 5 5 8 8
4	0 0 0 3 5 5 8 8 8
5	0 0 0 0 0

key: 5 | 0 means 50